

Appl. No. 10/707,215
Amdt. dated 10/22/2004
Reply to Office action of 09/22/2004

Amendments to the Claims:

Listing of Claims:

- 5 Claim 1 (original): A method of fabricating a bipolar junction transistor, the method comprising:
- providing a substrate, the substrate comprising a plurality of isolation structures for defining at least an active area;
 - implanting ions of a first conductive type into the substrate to form a
 - 10 doping region in the active area;
 - forming a protective layer on the substrate, the protective layer comprising an opening to expose the doping region; and
 - forming a first doping layer of a second conductive type and a second doping layer of the first conductive type on the doping region.
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- Claim 2 (original): The method of claim 1 wherein the doping region comprises an N-type doping region.
- Claim 3 (original): The method of claim 2 wherein the first doping layer
- 20 comprises a P-type epitaxial layer made of silicon/silicon germanium.
- Claim 4 (original): The method of claim 2 wherein the second doping layer comprises an N-type epitaxial layer or an N-type polysilicon layer.
- 25 Claim 5 (original): The method of claim 1 further comprising the following steps when forming the first doping layer and the second doping

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layer on the doping region:

forming a first epitaxial layer of the second conductive type and a second epitaxial layer of the first conductive type on the substrate;

5 removing a portion of the second epitaxial layer to form the second doping layer on the doping region;

implanting ions of the second conductive type into the first epitaxial layer; and

removing a portion of the first epitaxial layer to form the first doping layer on the doping region.
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Claim 6 (original): The method of claim 1 further comprising the following steps when forming the first doping layer and the second doping layer on the doping region:

15 forming an epitaxial layer of the second conductive type and a doped polysilicon layer of the first conductive type on the substrate;

removing a portion of the doped polysilicon layer to form the second doping layer on the doping region;

implanting ions of the second conductive type into the epitaxial layer;
20 and

removing a portion of the epitaxial layer to form the first doping layer on the doping region.

Claim 7 (canceled)

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Claim 8 (canceled)

Claim 9 (original): The method of claim 1 further comprising:

forming a spacer on either side of the first doping layer and on either

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side of the second doping layer; and

forming a silicide layer on surfaces of the doping region, the first doping layer and the second doping layer.

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Claim 10 (original): The method of claim 1 wherein the doping region comprises an emitter of the bipolar junction transistor, the first doping layer comprises a base of the bipolar junction transistor, and the second doping layer comprises a collector of the bipolar junction transistor.

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Claim 11 (original): The method of claim 1 wherein the doping region comprises a collector of the bipolar junction transistor, the first doping layer comprises a base of the bipolar junction transistor, and the second doping layer comprises an emitter of the bipolar junction transistor.

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Claim 12 (original): A method of fabricating a bipolar junction transistor, the method comprising:

providing a substrate, the substrate comprising a plurality of isolation structures for defining at least an active area;

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implanting ions of a first conductive type into the substrate to form a doping region in the active area;

forming a protective layer on the substrate, the protective layer comprising an opening to expose the doping region;

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forming a first doping layer of a second conductive type and a second doping layer of the first conductive type on the substrate;

removing the second doping layer except the portions of the second doping layer covering the doping region;

implanting ions of the second conductive type into the first doping layer; and

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removing the first doping layer except the portions of the first doping layer covering the doping region.

- 5 Claim 13 (original): The method of claim 12 wherein the doping region comprises an N-type doping region.

Claim 14 (original): The method of claim 13 wherein the first doping layer comprises a P-type epitaxial layer.

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Claim 15 (original): The method of claim 13 wherein the second doping layer comprises an N-type epitaxial layer or an N-type polysilicon layer.

Claim 16 (original): The method of claim 12 further comprising:

- 15 forming a spacer on either side of the first doping layer and on either side of the second doping layer; and
forming a silicide layer on surfaces of the doping region, the first doping layer and the second doping layer.

- 20 Claim 17 (original): The method of claim 12 wherein the doping region comprises an emitter of the bipolar junction transistor, the first doping layer comprises a base of the bipolar junction transistor, and the second doping layer comprises a collector of the bipolar junction transistor.

- 25 Claim 18 (original): The method of claim 12 wherein the doping region comprises a collector of the bipolar junction transistor, the first doping layer comprises a base of the bipolar junction transistor, and the second doping layer comprises an emitter of the bipolar junction transistor.

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Claim 19 (original): The method of claim 12 wherein the protective layer comprises an oxide layer or a silicon nitride layer.

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